UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

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SUBJECT: Biological Technical Assistance Group Meeting

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The following comments represent the consensus of the Region II Biological Technical Assistance Group (BTAG) review (meeting of 22 April 1993) of the "Remedial Investigation/Feasibility Study (RI/FS) Work Plan" for the Ventron-Velsicol site located in Wood-Ridge, Bergen County, New Jersey.

The activities proposed in the Work Plan appear inappropriate to adequately assess the complete vertical and horizontal extent of contamination to the degree of certainty necessary to determine source areas and support remedial decisions. Therefore, these proposed activities should be viewed as only a preliminary phase of the RI. The 200 foot grid sampling, the collection of two foot cores, and the use of X-Ray Fluorescence (XRF) analysis may be appropriate if the goal is only to conduct an initial screening to determine the gross horizontal extent of surface contamination. Therefore, due to the design of the proposed Work Plan, the possible types of mercury disposal on the site, and the potential for the site history to have included cut and fill operations, the RI should allow for additional phases to incorporate revisions to the sampling strategy as the definition of site contamination becomes more clear.

Sampling the site based on a 200 foot grid allows for the collection of approximately one sample per acre, which may not be adequate to investigate the site. Such sparse sampling, together with the proposed homogenization of a zero to two foot core sample, may allow the true nature of site contamination to escape detection. While surface soils are of concern in addressing certain aspects of a risk assessment (i.e., the top six inches are of the most concern for soils when addressing ecological risk to terrestrial receptors), contamination at the site may be present at various depths and represent a significant source of risk to the environment which should be identified.

The apparent limitation in defining the extent of contamination due to the design of the proposed investigation is further confounded by the relatively high detection limits of certain XRF methodologies (high as compared to the levels of concern for mercury in the environment). Typically, XRF is appropriate for use as a screening tool. However, it may not be appropriate as a tool for creating a definitive representation of site contamination. The data quality objectives, methodologies, QA/QC

practices, and detection limits used for XRF should all be clearly identified and defined, and should be confirmed as being appropriate practices prior to the implementation of the work (e.g., heat drying of sediment samples may have a potential to volatilize mercury). A portion of the samples should be sent for full TCL/TAL scan in order to identify other potential site-related contaminants and to confirm the XRF results. The presentation of XRF sampling results should include arithmetic mean (rather than geometric), range, frequency of detection, and the locations of detections so that the data can be appropriately considered. The presentation of local reference sample levels for contaminants of concern and appropriate criteria and/or guidance levels may also facilitate data interpretation.

Theoretically, recently deposited organic mercury might be present near the surface in uniform concentrations, for which this sampling plan might be appropriate. However, there may be a potential at this site that historically deposited mercury was in elemental form. Elemental mercury may bead up and sink into the soils. A random distribution of beads of mercury, along with the possibility of the mercury having migrated down into the soils, may lead to a hit or miss sampling of the zero to two foot soil layer. Also, the contaminated soils may have been covered with fill cut from other portions of the site or imported onto the site. The presence and depth of fill over contaminated soils may lead to an apparent reduction of contaminant concentration due to its "dilution" with the clean fill or a lack of its detection entirely. The data generated through the proposed sampling method may not accurately depict site conditions and may not, therefore, support an accurate risk assessment for the site. To overcome this, some phase of the RI may need to include a determination of the site conditions at the time that the contamination was introduced. This would allow any contamination that currently may be under fill to be appropriately sampled and defined. Investigative tools such as review of historic aerial photographs may aid in an understanding of site conditions. A determination of the form in which the mercury is present in the various portions of the site (e.g., elemental in process waste disposal areas, organic in discharge areas) should also be made to assist in the planning of the RI and sampling strategies.

On page 56, the document discusses the performance of an Environmental Assessment of the site. The requirements of this assessment, as described in the Work Plan, are somewhat vague. It is recommended that this portion of the plan be revised to detail more clearly what these requirements are and how they will be met. It is important to note that all potential habitat areas present on the site should be given equal consideration in this evaluation. Appropriate endpoints should be selected to evaluate potential impacts of site related contamination. Where available, contaminant levels should be compared to screening values appropriate for the medium (e.g., Federal Ambient Water

Quality Criteria acute and chronic toxicity levels for surface water, NOAA ER-L and ER-M values for sediments). For contaminants or media for which no such screening values are available, ecological effects data available in scientific literature should be reviewed. If significant uncertainty regarding potential environmental impacts remains, site specific investigations, such as bioassays, rapid bioassessment techniques, or tissue sampling, may be appropriate to more adequately characterize risks.

The Work Plan indicated that the site will be cleared of vegetation in order to facilitate soil sampling activities. Efforts should be made to avoid impacts in the wetland areas proposed for sampling, and to minimize any unavoidable impacts. If any wetlands or other significant habitat areas will be impacted by vegetation clearing, mitigation and/or restoration plans may need to be developed. It is recommended that all habitat evaluations and/or wetland delineations be completed prior to any clearing of vegetation. Also, appropriate soil stabilization and sediment control measures should be conducted, and Best Management Practices followed, to prevent or minimize the potential migration of site contaminants and off-site impacts from soil erosion. For similar reasons, no surface discharge for well purge water (page 40) should be undertaken, due to the potential for the groundwater to be contaminated, and for the runoff to transport contaminated soil.

The parameters cited for analysis of the surface waters of the drainage ditch and Berry's Creek are listed on pages 44 and 46, respectively. Additional parameters for surface water should include organic mercury and hardness, as organic mercury is a bioavailable form of that contaminant and hardness affects the toxicity of many inorganic contaminants. The parameters cited for analysis of sediments from the drainage ditch and Berry's Creek are listed on pages 45 and 47, respectively. Additional parameters for sediments should include total organic carbon (TOC) and grain size distribution, which are both parameters influencing a contaminant's bioavailability. While Berry's Creek is proposed for sampling only adjacent to the site (page 45), the possibility of upgradient transport of contaminants due to tidal influence on the creek should be considered.

The rationale for the selection of the chosen surface water and sediment sampling locations for Berry's Creek should be provided. Sediment samples should be collected from depositional areas. In addition to the one sediment sample specified for Berry's Creek, it may be appropriate to collect sediment samples from groundwater discharge areas, or seeps, in the wetlands adjacent to the creek. While the surface layer of sediments is of the most concern for the current risk to benthic receptors, it may be necessary to sample the sediments in discrete vertical samples (e.g., six inches) to define the distribution of sediment

contamination. This would aid in the understanding of the ecological risk from, and the potential role as a source of, the sediments adjacent to the site because the potential exists that significant amounts of mercury may be buried under layers of deposited sediments.

The BTAG is interested in reviewing any future documents pertaining to this site, as well as the separate RI/FS dealing with the Berry's Creek drainage basin. We are also interested in obtaining feedback regarding the usefulness of our comments. If you have any questions, comments, or require further information, please contact me at (908) 906-6994.

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